BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,560	10/12/2001	Taichi Ichihashi	990952A	7532

23850 7590 11/10/2003

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER	
ANGEBRANNDT, MARTIN J	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 11/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/975,560	ICHIHASHI ET AL.	
	Examiner	Art Unit	
	Martin J Angebranndt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-4 and 6-17* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/372,102* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *10/12/01* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1 No rejection is made over the composition of EP 0323191 due to the high colorant concentration (carbon black).

2a The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2b The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3 Claims 1-4, 6-10,13,14 and 16 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Fitchett et al. EP 0342812.

Fitchett et al, EP 0342812 in example 1, teaches a prepolymer which has residual ethylenic unsaturation containing diallylphthalate, allyl methacrylate and vinylidene chloride which is added to an acrylate/triacrylate monomer composition and a photoinitiating system. The recording of a holographic grating using the composition is described in that example. The

other examples are similar and meet the claims as well. Useful multi-functional monomers disclosed include diacrylates and dimethacrylates (7/40-55)

The examiner notes that the claims do not recite a non-aqueous solvent, but rely upon the functional language "being soluble in the non-aqueous solvent". The range of non-aqueous solvents disclosed by the applicant on page 39 include very polar solvents such as acetone, methanol and acetonitrile and methyl ethyl ketone (MEK) to non-polar solvents such as benzene, xylene and toluene. The examiner reads the claims not to exclude aqueous based compositions, but to embrace them if they would be soluble in solvent other than water. In the case of the Fitchett et al, EP 0342812, example 1, the examiner holds that it is inherently soluble in other polar solvent, other than water, such as acetone or alcohols.

4 Claims 1-4, 6-10,13,14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitchett et al. EP 0342812.

It would have been obvious to one skilled in the art to use a diacrylate or dimethacrylate in place of the acrylates used in the cited examples with a reasonable expectation of achieving comparable results based upon the disclosure of equivalent functionality on page 7 at lines 40-55.

The examiner notes that triacrylates contains two polymerizable groups and therefore meet the limitation of claim 10. This rejection is provided to account for the likely modification of the claim to be limited to dimethacrylates.

5 Claims 1-4,7-10,13,14 and 16-17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Kamayachi et al. EP 0323563.

Kamayachi et al. EP 0323563 in example 4, teaches an diallylisophthalate polymer, a resin derived from an acrylate, a triacrylate, a diacrylate and a photocuring agent to render it photosensitive. The solvents are cellosolve acetate (examples 4 and preparation example 3) and the tetramethyl benzene based petrolic solvent, IPSOL #150 (preparation examples 3).

The applicant argues that there is nothing teachings the relative refractive index of the allyl based diallyl phthalate prepolymer (Daiso DAP) and the acrylates. The examiner notes that Trimethylol propane triacrylate is disclosed on page 11 at line 3 of the instant specification and that triethylene glycol diacrylate is disclosed on page 10 at lines 20-21 and that the prepolymer is derived from diallyl phthalates is (Daiso DAP) disclosed on page 5 at lines 14-16.

6 Claims 1,3,4,7-10 and 16 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 10-237140.

JP 10-237140 (machine translation attached) teaches light curable varnishes containing allyl pre-polymers with MW of 20,000-30,000 together with acrylate monomers, such as DPHA and MANDA together with a photoinitiator Irgacure 907 [tables and [0020-0021]. No solvent seems to be mentioned.

7 Claims 1,3,4,7-10 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 58-199341.

JP 58-199341 teaches in example 1, a diallylterephthalate polymer with a MW of 7223, methyl ethyl ketone (MEK, solvent), tetraethylene glycol acrylate, and benzoin ether (photoinitiator) (page 4/lower left column). The use of allyl pre-polymers having Mw of 3000-20,000 is disclosed in the abstract and page 2/lower left column.

It would have been obvious to modify example 1 by using a higher molecular weight diallylterephthalate polymer, such as those having a MW of 10,000-20,000 based upon the disclosure of equivalence within the reference.

8 Claims 1,3,4,7-10 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 02-135350.

JP 02-135350 teaches a diallyphthalate pre-polymer (mw 7,000), tripropylmethanol tetracrylate (monomer), Epikote 152, and a benzophenone photoinitiator. (table 1). The solvent is butyl cellosolve acetate (page 4/lower left). The allyl pre-polymer has a MW of 3,000-30,000 (abstract, page 1/lower left). The solution is described as soluble in a chlorine based solvent (methylene chloride).

It would have been obvious to modify the examples by using a higher molecular weight diallylterephthalate polymer, such as those having a MW of 10,000-30,000 based upon the disclosure of equivalence within the reference.

9 Claims 1,3,4 and 7-16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 56065010.

JP 56065010 teaches in example 3 containing an allyl pre-polymer, a polyester, a diallylorthophthalate monomer, a pentaerythritol tetracrylate monomer and benzoyl peroxide photoinitiator. (table 1). Examples 4 uses a vinylisophthalate rather than the pentaerythritol tetracrylate. The use of tribromophenyl acrylates is disclosed in the abstract. The allyl pre-polymer is disclosed as having a number average MW of 2,000-20,000 per allyl group (abstract and page 2/upper left column). These are powder coated or melt coated.

It is not clear what the MW of the diallylorthophthalate monomer in examples 3 or 4 is. The examiner holds that the MW is either within the range recited in the claims or alternatively it would have been obvious to modify the example to use diallylorthophthalate monomers within the MW range of 10,000 to 20,000 based upon the disclosure of equivalence. Further, it would have been obvious to use the tribromophenyl acrylates monomers in lace of the monomer used in the examples based upon the disclosure of the use of these monomers.

10 Claims 1,3,4 and 7-17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Takhashi et al. EP 0249468.

Takhashi et al. EP 0249468 teach in table 1, example 6 containing an allyl pre-polymer (C-3) , a vinyl derived polymeric binder (A-1), a pentaerythritol tetracrylate monomer (B-1 or B-2) and benzoyl peroxide photoinitiator. (table 1).

Note formula III in claim 11.

11 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

WO 99/14274 teaches inorganic/organic matrices formed in part from diallyl phthalate monomers, but does not teach the use of these in photosensitive materials.

Doi et al. '951, Ishii et al. JP 02-077414 and JP 54-127952 teach compositions similar to those embraced by the claims, but does not discuss MW of the allyl phthalates.

Minorikawa et al. JP 03-199218 teach compositions similar to those embraced by the claims and is considered to be cumlative.

12 Claim 5 is objected to as being dependent upon a rejected claim, but allowable over the prior art of record.

12 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

November 3, 2003